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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,884	12/04/2003	Timothy A. Christensen	03-OPC-295	6737

7590 10/20/2004

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EXAMINER	
LE, JOHN H	

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/727,884	CHRISTENSEN ET AL.	
	Examiner	Art Unit	
	John H Le	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,8-11 and 13-20* is/are rejected.

7)☒ Claim(s) *4,6,7 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 5, 8-11, and 13-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Christensen (USP 6,650,111).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1, Christensen discloses a method for operating a proximity sensor (10) comprising: providing a performance reference defining a relationship between a parameter of a sensor signal and a characteristic of an object to be detected (Col.4, lines 21-47); deriving a function that specifies deviation of performance of the proximity sensor from the performance reference

(Col.4, lines 21-38); providing a threshold value for the parameter (Col.4, lines 5-8); thereafter, operating the proximity sensor to produce the sensor signal (Col.8, lines 2-9); employing the function to normalize the sensor signal produced by operating the proximity sensor to produce a normalized signal (Col.1, lines 51-55, Col.11, lines 5-16); and comparing (comparator 58) the normalized signal to the threshold value to determine whether an object is present (metal of object is present within sensing range)(Col.4, lines 39-57, Col.5, lines 37-46).

Regarding claim 2, Christensen discloses the parameter is how many cycles (number of pulses) of the sensor signal which exceed a threshold level (voltage level)(Col.4, lines 48-57).

Regarding claim 3, Christensen discloses deriving a function comprises: characterizing performance of the proximity sensor to develop sensor data defining a relationship between the parameter of the sensor signal produced by the proximity sensor and the characteristic of the object; and deriving the function based on deviation of the sensor data from the performance reference (Col.5, lines 10-20).

Regarding claim 5, Christensen discloses the function is a gain factor (Q factor) indicating deviation between the sensor data and the reference performance data (Col.4, lines 24-34).

Regarding claim 8, Christensen discloses defining a reference distance value (Col.3, lines 16-19); and wherein providing a threshold value (voltage level) comprises employing the reference performance data and the reference distance

value to define the threshold value for the characteristic of an object to be detected (Col.4, line 39-Col.5, line 9).

Regarding claim 9, Christensen discloses defining a reference distance value comprises obtaining a value from another proximity sensor (Col.5, lines 11-21, Col.7, line 66-Col.8, line 5).

Regarding claim 10, Christensen discloses a method for operating a proximity sensor comprising: providing reference performance data defining a relationship between a numeric value (quality factor Q) produced from a sensor signal and distance to an object to be detected (Col.2, lines 17-20); characterizing performance of the proximity sensor to develop sensor data defining a relationship between a numerical value produced from the sensor signal of the proximity sensor and distance to an object to be detected (Col.2, lines 20-23); deriving a function that specifies deviation of the sensor data from the reference performance data (Col.4, lines 21-38); thereafter, operating the proximity sensor to produce a given numerical value (Col.8, lines 2-9); employing the function to normalize the given numerical value, thereby producing a normalized value (Col.1, lines 51-55, Col.11, lines 5-16); and determining, in response to the normalized value, whether an object is present (metal of object is present within sensing range)(Col.4, lines 39-57, Col.5, lines 37-46).

Regarding claim 11, Christensen discloses the numerical value (quality factor Q) is how many cycles (number of pluses) of the sensor signal exceed a threshold level (voltage level) (Col.4, lines 48-52).

Regarding claim 13, Christensen discloses the function is a gain factor (Q factor); and employing the function comprises multiplying the given numerical value (number of pluses) by the gain factor (Col.5, lines 10-21).

Regarding claim 14, Christensen discloses defining a reference distance value (Col.3, lines 16-19), and employing the reference performance data and the reference distance value to define a threshold level (voltage level) for the numerical value (number of pluses); and wherein determining whether an object is present also is in response to the threshold level (Col.4, line 39-Col.5, line 21).

Regarding claim 15, Christensen discloses defining a reference distance value comprises obtaining a distance value from another proximity sensor (Col.5, lines 11-21, Col.7, line 66-Col.8, line 5).

Regarding claim 16, Christensen discloses a method for operating a proximity sensor comprising: providing reference performance data defining a relationship between a count of sensor signal cycles and distance to an object to be detected (Col.5, lines 11-40); characterizing performance of the proximity sensor to develop sensor data defining a relationship between a count of cycles of a signal of the proximity sensor and distance to an object to be detected (Col.5, lines 21-40); deriving a function that specifies deviation of the sensor data from the reference performance data (Col.6, lines 35-39); specifying a reference distance value (Col.6, lines 53-59); employing the reference performance data and the reference distance value to define a threshold count value (Col.9, lines 36-46); thereafter, applying a stimulation pulse to a resonant circuit of the proximity sensor to generate an oscillating signal (Col.2, lines 14-17); counting

cycles (pulse count) of the oscillating signal which exceed a predefined signal level (threshold value), thereby producing a signal count (Col.9, lines 36-46); determining whether an object is present wherein such determination employs the function, the signal count and the threshold count value (Col.9, lines 36-49).

Regarding claim 17, Christensen discloses determining whether an object is present comprises: employing the function to normalize the signal count, thereby producing a normalized count (Col.1, lines 51-55, Col.5, lines 22-40, Col.11, lines 5-16); and comparing the normalized count to the threshold count value (Col.9, lines 36-46).

Regarding claim 18, Christensen discloses the function is a gain factor (Q factor); and employing the function to normalize the signal count comprises multiplying the signal count (numbers of pluses) by the gain factor (Col.5, lines 10-21).

Regarding claim 19, Christensen discloses determining whether an object is present comprises: employing the function to convert the threshold value into an adjusted threshold (Col.4, lines 5-7); and comparing (trigger) the signal count (counting of pluses) to the adjusted threshold (Col.4, lines 5-13).

Regarding claim 20, Christensen discloses specifying a reference distance value comprises obtaining the reference distance value from another proximity sensor (Col.5, lines 11-21, Col.7, line 66-Col.8, line 5).

Allowable Subject Matter

3. Claims 4, 6-7, and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 4, none of the prior art of record teaches or suggests the combination of a method for operating a proximity sensor comprising: providing a performance reference defining a relationship between a parameter of a sensor signal and a characteristic of an object to be detected; deriving a function that specifies deviation of performance of the proximity sensor from the performance reference; providing a threshold value for the parameter; thereafter, operating the proximity sensor to produce the sensor signal; employing the function to normalize the sensor signal produced by operating the proximity sensor to produce a normalized signal; and comparing the normalized signal to the threshold value to determine whether an object is present, wherein deriving a function comprises: characterizing performance of the proximity sensor to develop sensor data defining a relationship between the parameter of the sensor signal produced by the proximity sensor and the characteristic of the object; and deriving the function based on deviation of the sensor data from the performance reference, wherein the function is an equation defining the relationship between the sensor data and the reference performance data. It is these limitations as they are claimed in the combination with other limitations of claim, which have

not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 6, none of the prior art of record teaches or suggests the combination of a method for operating a proximity sensor comprising: providing a performance reference defining a relationship between a parameter of a sensor signal and a characteristic of an object to be detected; deriving a function that specifies deviation of performance of the proximity sensor from the performance reference; providing a threshold value for the parameter; thereafter, operating the proximity sensor to produce the sensor signal; employing the function to normalize the sensor signal produced by operating the proximity sensor to produce a normalized signal; and comparing the normalized signal to the threshold value to determine whether an object is present, wherein the function is a gain factor indicating deviation between the sensor data and the reference performance data, and wherein the parameter of the sensor signal is a count of cycles of the sensor signal which exceed a threshold level and employing the function to normalize the signal comprises multiplying the count of cycles by the gain factor. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 12, none of the prior art of record teaches or suggests the combination of a method for operating a proximity sensor comprising: providing reference performance data defining a relationship between a numeric value produced from a sensor signal and distance to an object to be detected;

characterizing performance of the proximity sensor to develop sensor data defining a relationship between a numerical value produced from the sensor signal of the proximity sensor and distance to an object to be detected; deriving a function that specifies deviation of the sensor data from the reference performance data; thereafter, operating the proximity sensor to produce a given numerical value; employing the function to normalize the given numerical value, thereby producing a normalized value; and determining, in response to the normalized value, whether an object is present, wherein the function is an equation defining the relationship between the sensor data and the reference performance data. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Other Prior Art

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Demma et al. (USP 6,025,711) disclose a proximity sensing circuit comprises a means, connected in signal communication with the coil, for determining a distance between a metal object and the coil as a function of the first and second output signals.

Demma et al. (USP 6,014,022) disclose proximity sensor circuit with frequency changing capability having a plurality of sensors and a multiplexer with a single filter.

Weisshaupt (USP 4,843,259) discloses a processing for the non-contacting detection of eddy current-induced bodies, particularly metal objects, well as to sensors based on the process.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John H Le whose telephone number is 571-272-2275. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Barlow can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John H. Le

Patent Examiner-Group 2863

October 17, 2004

John Barlow
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